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THE CYST NEMATODES OF KNOTWEED AND NUTGRASS

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Fig. 1. Cyst nematodes, Heterodera cyperi.

Heterodera cyperi Golden, Rau, and Cobb, 1962, and Cactodera weissi (Steiner, 1949) Krall and Krall, 1978, are two species of cyst nematodes found in Florida. Each species is known to infect only a single but different genus of weeds (3,5,8).

HETERODERA CYPERI: Heterodera cyperi (Fig. 1) is known in this country to parasitize only nutgrass (Cyperus esculentus L.) and has been referred to as the nutgrass cyst nematode (1,3,7). No pathological studies appear in the literature, but Golden et al. state that "many females and cysts were found to have developed on the hard tubers...". They also noted that some mature females and cysts with eggs could be seen under the epidermis of the root as well as breaking through the epidermis (1,3). As a rule, the swollen bodies of mature females of cyst nematode species break through the root epidermis and can be observed protruding from infected roots, but generally not below the root epidermis. Schindler and Golden conducted tests which indicated that H. cyperi is not parthenogenic and that the presence of males is necessary for reproduction (6).

The first specimens of H. cyperi appeared as unidentified cysts in samples from Ft. Myers, Florida, in 1954. Subsequent samples from North Carolina and Florida in 1956, 1957, and 1959 yielded additional specimens although not in sufficient numbers for critical taxonomic study. In 1960, collections from Sanford, Florida, yielded an additional quantity of specimens which resulted in the description of this nematode as a new species in 1962 (3).

In Florida, specimen recovery has been associated mostly with cabbage field samples collected during a survey for the sugarbeet or cabbage cyst nematode, Heterodera schachtii Schmidt, 1871. Heterodera cyperi is distributed throughout Florida and is known to occur in Arkansas, Georgia, and North Carolina (5). It occurs in plantings of economic crops, but no known studies have been made to assess the impact it may have on any given crop or the weeds associated with that crop. When cysts of H. cyperi are present in a sample, the diagnostician must be able to differentiate them from cysts of established regulatory status.

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CACTODERA WEISSI: Cactodera weissi has been referred to as the knotweed cyst nematode (2). It is known to infect the knotweed species Polygonum pensylvanicum L. and perhaps P. punctatum Ell. (2,4). The first published observation of this nematode was by G. Steiner in 1931, who observed cyst nematodes in samples from Virginia and mistakenly reported them as sugar beet cyst nematodes, Heterodera schachtii (2,7). A description was later published by Steiner in 1949, for a new nematode species Heterodera weissi, based on specimens collected from P. pensylvanicum in Maryland (8,9). The original description was amplified and expanded in 1953, 1972, and 1977. In 1978, Krall and Krall erected the genus Cactodera, to which a group of morphologically similar cyst nematodes, including H. weissi were assigned (2,4,5,7,9). Although heavy populations of C. weissi have been found on knotweed, it has been reported that no symptoms of decline were observed (9).

Cactodera weissi has been reported from Ontario and Quebec, Canada. In the United States, it is known to occur in Arkansas, Florida, Illinois, Iowa, Maryland, Michigan, Missouri, New Jersey, New York, North Carolina, Pennsylvania, Virginia, West Virginia, and Wisconsin (2,5). It has been found in south, central, and north Florida, although it has not been recovered from as many different locations as H. cyperi. Cactodera weissi, like H. cyperi, has been recovered in Florida most frequently from cabbage fields where the water table has been relatively high and conditions were favorable for the existence of knotweeds. As with H. cyperi, the impact of C. weissi upon economic crops and their associated weeds has yet to be closely studied. Cactodera weissi is a nematode about which little is known and its presence in a sample adds to the complexity of identification and evaluation.

SURVEY AND DETECTION:

1. With the aid of a hand lens, examine the roots of knotweed and nutgrass for the presence of swollen female nematodes or cysts.
2. Collect soil and roots from the base of the plant and submit them to a nematology laboratory.

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